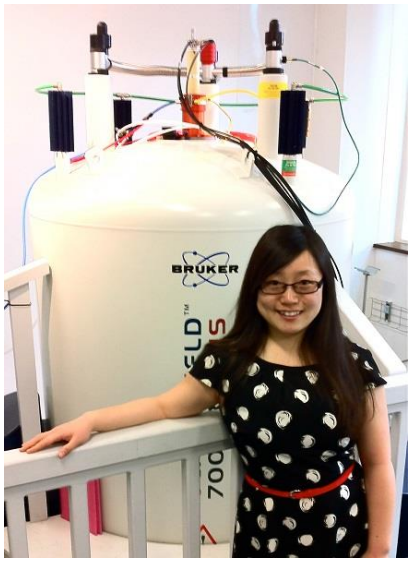
MRSEC SEMINAR SERIES

"Solid-state NMR and MRI Investigations of Interface Chemistry in Composite Materials."

Interfaces are integral parts of organic-inorganic composite materials and can significantly mechanical, optical, electrochemical, and biochemical properties. However, due to their intrinsic nature of being "buried", disordered, rich in light elements, or reactive, non-destructive investigations of interfaces are often challenging. Solid-state nuclear magnetic resonance spectroscopy and imaging are particularly useful to nondestructively study short-range structures and ion dynamics in their native states. Here we review established and new NMR and MRI techniques for characterizations of organic-inorganic interfaces and how to employ the obtained knowledge to alter the interface chemistry through synthetic and fabrication process for improved properties. Examples include organic-inorganic interfaces in bone, biomimetic materials, and composite materials for energy storage. The unique capabilities and available resources at the National High Magnetic Field Laboratories are particularly useful for materials research, including a broad range of magnetic fields, in-house customized probe building, ultra-high or low temperature NMR, and dynamic nuclear polarization NMR for surface enhanced detection. Employment and integration of these resources in our research will be discussed.



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Monday April 25, 2016
Ryan 4003
9:30 a.m. – 10:30 p.m.